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SUMMARY OF BEHAVIOR PATTERNS OF NORMAL CHILDREN.

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THE INTENT OF THIS STUDY WAS TO DETERMINE THE PATTERNS OF BEHAVIOR OF NURSERY SCHOOL CHILDREN, AND TO DETERMINE HOW THESE ARE RELATED TO BEHAVIOR PATTERNS AND ACHIEVEMENT IN ELEMENTARY SCHOOL. IN 1930-1938, THE BEHAVIORS OF 138 NURSERY SCHOOL CHILDREN WERE CHARACTERIZED BY THEIR TEACHERS IN TERMS OF 61 MOLAR VARIABLES. SUB-SAMPLES OF THIS GROUP WERE LATER RATED IN ELEMENTARY SCHOOL ON A SUBSET OF 20 BEHAVIORAL VARIABLES AND ON 6 ACHIEVEMENT MEASURES. PRINCIPLE COMPONENT FACTOR ANALYSIS WITH VARIMAX ROTATIONS WAS USED TO DETERMINE BEHAVIOR PATTERN FACTORS. TEN FACTORS, CONSISTING OF COMBINATIONS OF FROM 5 TO 12 OF THE BEHAVIORAL VARIABLES, WERE FOUND IN THE NURSERY SCHOOL SAMPLE. THESE COULD BE CHARACTERIZED BY SUCH TERMS AS EMOTIONAL REACTIVITY, SOCIABILITY, AND SOCIALIZATION. THE CONSISTENCY OF THE FACTORS WAS DEMONSTRATED BY PERFORMING INDEPENDENT ANALYSES ON HALVES OF THE BASIC SAMPLE. SEPARATE ANALYSES ON BOYS AND GIRLS FOUND SIMILAR FACTORS, BUT THEIR RELATIVE IMPORTANCE IN ACCOUNTING FOR BEHAVIOR VARIANCE DIFFERED. LONGITUDINAL STUDIES COMPARING 69 OF THE CHILDREN AT AGES 3 AND 4 1/2, AND SAMPLES OF 78, 61, AND 32 OF THE CHILDREN IN GRADES 1, 3, AND 5 FOUND SIMILAR BEHAVIOR PATTERNS. BUT SOME NEW FACTORS APPEARED IN THE OLDER CHILDREN. A COMPARISON OF THE NURSERY SCHOOL AND ELEMENTARY SCHOOL FACTORS INDICATED THAT ALTHOUGH THE FACTOR PATTERNS WERE MODERATELY CONSISTENT, THE RELATIVE RANKINGS OF THE INDIVIDUAL CHILDREN ON THE FACTORS EXHIBITED LITTLE CONSISTENCY. (THE FULL REPORT OF THIS STUDY IS PS 000 261.) (DR)

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Summary

of

Behavior Patterns of Normal Children

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The present study was an empirical examination of the general dimensions of a broad sample of nursery school behavior, and a follow-up of elementary school behavior and achievement. The specific purposes of the study were as follows:

1. To determine the patterns of behavior for a group of normal children in nursery school as these behaviors are described in specific molar terms.

2. To assess the extent to which two different samples of children from the same population display similar patterns of behavior.

3. To determine the patterns of behavior for boys and girls separately, and to ascertain their similarity.

4. To determine the patterns of behavior for a group of children at age three years and again for the same group at age four and one-half, to compare the patterns at the two age levels, and to measure their consistency for this age span.

5. To determine patterns of behavior at elementary grades one, three, and five, for sub-samples of the original subjects; to measure behavioral consistency during these years, and to assess the similarity of the patterns at the different age levels.

6. To compare results from separate analyses of elementary school behavior with the behavior patterns at nursery school age. Additionally, to relate these patterns to achievement data for grades one, three, and five.

The data for the study were systematically gathered at the Institute of Human Development Nursery School, University of California, Berkeley, from 1930 to 1938. Teachers at the Institute rated the children used in the study each semester of their attendance at the nursery school on 61 behavior variables selected from a large inventory of nursery school behavior. In the elementary school followup, the elementary school teachers rated the children on the 20 behaviors selected for that portion of the study and the achievement measures.

The data were analyzed for the purposes described above utilizing principal components factor analyses with varimax rotations. The techniques described by Pinneau and Newhouse (1964) were used in comparing factors across analyses and in making comparisons of relative stability with age.

To determine the patterns of behavior for the nursery school group as a whole the data analyzed were those collected on the children when they were of an average age of three years and six months, (Basic Sample: N=138). These analyses yielded ten factor patterns. In order of importance (i.e., amount of variance accounted for) these factors were tentatively labeled emotional reactivity, sociability, socialization, verbal creativity, confidence, achievement, affability,

self-assertion, affection, and vanity. Three of these--emotional reactivity, sociability, and socialization--accounted for 44 per cent of the total variance: the remaining seven accounted for 35 per cent of the total variance.

To assess the invariance of these dimensions, the Basic Sample was divided into the children who attended the Institute between 1930 and 1934 (the Early Invariance sample), and those who attended the Institute between 1934 and 1938 (the Late Invariance sample). The data from these two samples were analyzed independently, utilizing the same methods that were used with the data of the Basic Sample. Interest in this case was in comparing the general dimensions of behavior isolated for two different groups of children.

The results showed considerable correspondence between the factors for the two groups. Several factors were common to both analyses: sociability, emotional reactivity, socialization, verbal creativity, and achievement. Two others, labeled confidence and affability in the Early Invariance sample, appeared to be fused into a single factor in the Late Invariance sample. The objective measures of factorial invariance indicated substantial relationships between factors for the two independent analyses. Because of their similarity with one another and with the factors obtained for the Basic Sample, the factors obtained in the invariance analyses considerably support the factors isolated in the Basic Sample.

Separate analyses of the data for the two sexes showed

that ten factors identified for the Basic Sample were also identified in the results from separate analyses of data from the girls. These factors were sociability, emotional reactivity, socialization, verbal activity (creativity), confidence, affection, achievement, assurance (self-assertion), affability, and vanity. Similar results were obtained for the boys' sample. Several small factors that were difficult to interpret but which met the criterion of an eigenvalue of 1.00 appeared in either the analyses for the boys or for the girls.

The importance of the factors differed somewhat from the boys to the girls samples. Factor patterns of sociability, socialization, verbal creativity, and affection accounted for more variance for the boys than for the girls. Emotional reactivity, confidence, affability, and assurance factor patterns were more important in the analyses of the girls' data than for the boys' analyses.

The first of the longitudinal studies reported examined the similarity of factor structure obtained for a sub-sample of 69 children upon whom data were available at the time they were an average of three years of age and also when they were an average of four and one-half years of age. The data from the two different time periods were independently analyzed and the obtained factors were compared. The analyses showed that three factors obtained at the two age levels were highly related for the two ages and relatively independent of the other factors. These were sociability, confidence, and socialization. Two factors at age three--emotional reactivity and

impulse control--apparently fused to form one factor at four and one-half years. Four other factors that appeared in both analyses and seemed similar in some degree were also different in notable respects, as shown by the marker variables and the coefficients of factor invariance. These factors included affection, affability, and achievement. Some factors of lesser importance appeared at both ages and seemed little related to any factors in the other set. A number of the more prominent factors changed in relative importance from the three to the four and one-half year sample.

A second purpose of the analysis of the Consistency Samples was to determine the degree of stability in relative standing of the subjects over time. The coefficients of subject invariance obtained ranged from .305 to .735, with a median of .524. These coefficients are comparable in magnitude to correlation coefficients obtained in longitudinal studies of intelligence over the same time period and ages.

The twenty behavior variables rated at the elementary school years were analyzed separately for grades one (N=78), three (N=61), and five (N=32), using methods identical to those used in the foregoing analyses. Four behavioral factors, designated independence, socialization, sociability, and expressiveness, emerged from the first grade analyses. These four accounted for 68 per cent of the total variance in the behaviors studied. Two of these factors--independence and expressiveness--did not appear in this form in the analyses of 61 variables at the nursery school level.

The analyses of the third grade data yielded five factors accounting for 75 per cent of the total variance of behavior ratings. These factors were labeled independence, socialization-sociability, emotional reactivity, maturity, self-assertion.

Four factors were attained from the analyses of the fifth grade behavior ratings. In order of importance they were socialization, independence, sociability, and emotional reactivity. The first two of these accounted for 28 and 22 per cent of the total variance, while the latter two accounted for 13 and 12 per cent.

Six elementary school achievement variables were analyzed for grades one, three, and five, using methods previously applied to the behavior ratings. Two achievement factors were obtained at each of the grade levels. For the first and third grades these could be identified as motor skills and language skills. For the fifth grade sample the two factors were similarly labeled, although the language skills factor was more complex than at the earlier ages, with negative loadings for some of the motor skills variables. The per cent of total variance accounted for by the two factors at each level ranged from 71 to 81 per cent.

To compare the factors obtained at the nursery school and grades one, three, and five while controlling for the variables rated, the data for the 138 children in the Basic Sample was re-analyzed using only those ratings obtained in the nursery

school on the 20 variables used in the elementary school followup. This analysis yielded four factors, all of which were found in earlier analyses utilizing data on the 61 variables. These factors were sociability, socialization, verbal creativity, and independence.

In comparing these factors with those obtained in the elementary grades only those subjects in the nursery school were used who were available in the elementary school follow-up, thus eliminating any differences due to different subjects. Sociability and socialization showed the most stable relationships between nursery school and elementary school factor structures. The independence factor in nursery school also displayed considerable consistency. The nursery school factor expressiveness varied in its relationships with factors in the grade school analyses.

In the first grade to third grade factor comparisors, and in the comparable first to fifth grade comparisons, first grade factors were highly related to one or more third or fifth grade factors, and usually to the factor of the same name. In addition, other slight to moderate relationships were found. For the most part comparable results were also found in the third grade-fifth grade comparison.

In the analyses to assess subject invariance from the nursery school to elementary school, the consistency of individual differences as opposed to factor structure over time, little consistent subject invariance was found other than that for the dimension socialization. In some cases

nursery school relative standing on one factor was somewhat predictive of relative standing on a different dimension at a later age (e.g., nursery school sociability factor scores and third grade maturity scores).

Over-all in the various analyses done at different ages a number of factors of similar structure were obtained, indicating the general importance of these dimensions at different ages encompassed by the study. In general, the analyses indicated greater consistency of the dimensions isolated at different ages than relative standing of the subjects over the time periods studied.